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Conference Abstract

Bioscience Data Literacy At The Interface Of The Environment, Human And Wildlife: One Health-centred education, research and practice perspectives in Rwanda

Prosper Karame‡, Faustin Gashakamba§, Valentine Dushimiyimana|, Ladislas Nshimiyimana¶, Pacifique Ndishimye#

‡ Rwanda Medical Research Center - Rwanda Biomedical Center, Kigali, Rwanda
§ University of Rwanda - College of Science and Technology, Kigali, Rwanda
| Ghent University, Ghent, Belgium
¶ Rwanda Biomedical Center, Kigali, Rwanda
# Rwanda Medical Research Center, Kigali, Rwanda

Corresponding author: Prosper Karame (karapros@gmail.com)

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Abstract

Advances in information technology have led to the availability of state-of-the-art technologies which in turn have been enabling the generation of unprecedented amounts of complex, structured or unstructured data sets that are sometimes difficult to process using conventional techniques. In particular, handling these large scale data in terms of collection, and aggregation, synthesis and analysis, interpretation, reporting, sharing and archiving processes, and interpreting them into descriptive models and enable effective interpretation requires continued development of robust computational models, algorithms and interoperable analytical frameworks (Hampton et al. 2017). This also involves the vital availability of data management expertise and reflects an imperative need for data science professionals, especially in the context of generating the most informative data for use and drive evidence-based decisions. Considering this, Rwanda has been fueling its economic

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transformation agenda, and, while this solely depends on natural resources exploitation, the scenario has led to critically concerning anthropogenic threats and unprecedented environmental vulnerability. Acknowledging the urgency to achieve its development needs while at the same time safeguarding the environmental sustainability, Rwanda has been promoting technology-enabled systems and approaches for sustainable management of environment and natural resources.

Learning from global initiatives, Rwanda's journey targets the effective use of technology-supported systems and data science expertise to effectively drive management and decision making needs in environmental management, health research systems and biodiversity conservation planning (Karame et al. 2017). Rwanda champions the adoption and effective use of technology towards delivering its vision of knowledge-based economy. A particular emphasis relates to streamlining the education, research and application of technology-supported systems and platforms and strengthening their effective use. From a practical One Health perspective, Rwanda has been bridging inter-sectoral gaps related to joint planning and resource sharing for informed decision processes. This One Health concept emphasizes the interconnection of the health of human, animals and ecosystems and involves the applications of multidisciplinary, coordinated, cross-sectoral collaborative efforts to attain optimal health for people, animals and the environment (Buttke et al. 2015). One Health constitutes a promising approach in the advancement of biosciences. For example, big data and ecological and digital epidemiology analysis has led to promising progress beyond the traditional transdisciplinary conservation medicine approach, and One Health is now driving solutions to major conservation and health challenges.

This paper aims to explore the perspectives of solving challenges in handling heterogeneous data and sources of uncertainty, the progress and feasibility of adopting (or developing, adapting and customizing) open code- and data-sharing platforms, and integrating the application of flexible statistical models and cloud-computing, all within the confines of limited resources. Africa needs to engage in data science to build and sustain capacity and to effectively use acquired knowledge and skills. Further, Africa can strategically align and tailor existing technology data science platforms to the unique context of this continent. It is time to assess the boundaries, explore new horizons, and reach beyond the limits of current practice in order to enable researchers to get the most from generated data. We envision a long-term integrative and digital approach to handling and processing health, environment, and wildlife data to mark the beginning of our journey forward.

Keywords

bioscience, data-literacy, one-health, environment, health, wildlife management

Presenting author

Prosper Karame

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Ethics and security

The initiative complies to ICH GCP Ethical Guidelines and Ethical Guidelines for the Use of Animals in Research

Author contributions

The authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Conflicts of interest

The authors declare no commercial or financial relationships that could be construed as a potential conflict of interest.

References

- Buttke D, Decker D, Wild M (2015) THE ROLE OF ONE HEALTH IN WILDLIFE CONSERVATION: A CHALLENGE AND OPPORTUNITY. Journal of Wildlife Diseases 51 (1): 1-8. https://doi.org/10.7589/2014-01-004
- Hampton S, Jones M, Wasser L, Schildhauer M, Supp S, Brun J, Hernandez R, Boettiger C, Collins S, Gross L, Fernández D, Budden A, White E, Teal T, Labou S, Aukema J (2017) Skills and Knowledge for Data-Intensive Environmental Research. BioScience 67 (6): 546-557. https://doi.org/10.1093/biosci/bix025
- Karame P, Avalos T, Gashakamba F (2017) TOWARDS WISE USE OF WETLANDS OF SPECIAL IMPORTANCE IN RWANDA. ARCOSNETWORK[In English]. URL: www.arcosnetwork.org/uploads/2018/03/Rweru-Mugesera_assessment_Report.pdf